



Joint Informational Hearing

Assembly and Senate Health Committees

Hospital Seismic Safety: Looking Ahead to the 2030 Requirement to Remain Operational

Tuesday, January 28, 2020—1:30 p.m.

State Capitol, Room 4202

A Primer on Hospital Seismic Safety Requirements

Introduction

In the early morning hours of February 9, 1971, California experienced the San Fernando Valley (also known as Sylmar) earthquake. Collapsed buildings at the Veteran’s Administration Hospital caused 47 of the more than 60 deaths attributed to the earthquake. Olive View Medical Center also experienced heavy damage, causing three deaths – one death caused by a collapsing structure, and two others as a result of the loss of power to their life support systems. Several other hospitals were impacted and had to evacuate. As a result, in 1973, the Legislature passed the Alfred E. Alquist Seismic Safety Act (Seismic Safety Act), which required all new hospital construction to meet stringent seismic safety standards. The original Seismic Safety Act did not apply to existing buildings, partly because of the expectation that older hospital buildings would be replaced with conforming buildings over time. However, by the time the 1994 Northridge earthquake occurred more than 20 years later, 80% of hospital beds were still in pre-1973 non-conforming buildings.

The Northridge earthquake caused significant structural damage to a number of hospitals, with one hospital evacuated because of severe diagonal cracking, and another evacuated because of a potential loss of vertical support. From a structural standpoint, hospitals constructed after the Seismic Safety Act withstood the earthquake relatively well. Comparisons of hospital buildings constructed before and after the 1973 standards showed that the Seismic Safety Act was very important in limiting structural damage. However, the Northridge earthquake revealed that for health care providers and emergency services planners, nonstructural damage is a serious threat to patient safety and a hospital’s capacity to function. In two cases, nonstructural damage was so severe that hospitals were forced to close. In other facilities, damage to heating and ventilation systems and sprinklers forced major evacuations, even though there was no significant structural damage to the buildings. The Northridge earthquake experience prompted the Legislature to update the Seismic Safety Act in 1994 in order to bring older hospital buildings into compliance with structural requirements by 2008 (which was subsequently delayed through various bills over the years), and to adopt additional requirements that would ensure hospitals, by January 1, 2030, would not only remain standing, but would also remain operational following a major earthquake (referred to as “2030 compliance”).

SB 1953 (Alquist of 1994)

The Creation of Seismic Performance Categories

The bill that updated the Seismic Safety Act following the Northridge earthquake was SB 1953 (Alquist, Chapter 740, Statutes of 1994). SB 1953 required the Office of Statewide Health Planning and Development (OSHPD) to create seismic performance categories for hospitals depending on the risk of collapse, and the ability to remain operable following an earthquake. Specifically, SB 1953 required OSHPD to create structural performance categories (SPCs), as well as nonstructural performance categories (NPCs) for “nonstructural systems that are critical to providing basic services to hospital inpatients and the public after a disaster.” Each hospital building receives both an SPC and an NPC rating. According to OSHPD, the SPC requirements can be thought of as protecting the skeleton, while NPC requirements ensure the organs and other tissues that are necessary for a human body to function will remain safely attached to the skeleton. It is important to note that a licensed facility, or hospital, is often made up of several buildings on its campus. Many hospitals may have one or more buildings that are 2030 compliant, while other buildings still need to be retrofitted or replaced.

Explanation of SPC Ratings

Following the enactment of SB 1953, OSHPD adopted regulations that initially created five SPC ratings, with a sixth category (SPC-4D) added more recently. The SPC ratings are as follows:

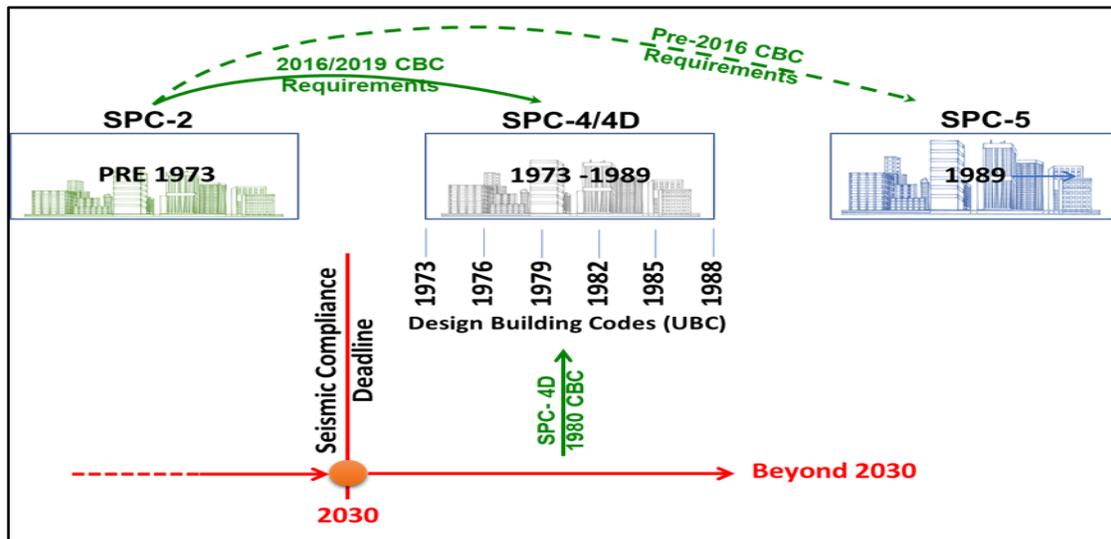
- SPC 1 – These are pre-1973 buildings (built prior to the adoption of the Seismic Safety Act standards) that are at significant risk of collapse and that represent a danger to the public. *These buildings were originally required to be brought up to SPC 2 level or removed from service by 2008, but there have been a number of extensions. Most recently, AB 2190 (Reyes, Chapter 673, Statutes of 2018), provided for an extension until July 1, 2022 for hospitals that plan to replace or retrofit to SPC 2, and up to January 1, 2025 for hospitals that plan to retrofit to SPC 4D or replace with a new SPC 5 building.*
- SPC 2 – These are also pre-1973 buildings, but were in substantial compliance with pre-1973 California Building Standards Codes, and while they may not be repairable or functional following an earthquake, they will not significantly jeopardize life. *These buildings are permitted to remain in service only until January 1, 2030, at which point they need to have been replaced by an SPC 5 building, have the acute care services relocated to a conforming building (SPC 3, 4, or 5), or be retrofitted to SPC 4D.*

The following categories are 2030 compliant, and can continue operating indefinitely:

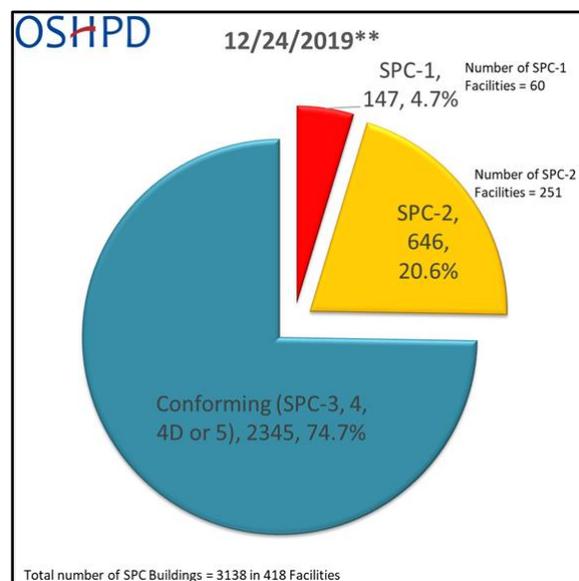
- SPC 3 – These buildings are in compliance with the original 1973 Seismic Safety Act, but were constructed under a permit issued prior to October 25, 1994, and utilized steel moment-resisting frames. These buildings may experience structural damage during an earthquake which does not significantly jeopardize life, but may not be repairable or functional following strong ground motion.
- SPC 4 – These are buildings constructed in compliance with the Seismic Safety Act under building permits issued between 1973 and 1989, but may experience structural damage which may inhibit the ability to provide services to the public following strong ground motion.

- SPC 4D – This is a new category created to allow SPC 2 buildings to be retrofitted to a standard that is 2030 compliant. Because SPC 2 buildings were constructed prior to 1973, they can never reach SPC 3, 4 or 5, since these categories required construction to have started after the adoption of the 1973 standards. SPC 4D became effective on January 1, 2017.
- SPC 5 – These are buildings constructed after 1989, and are considered reasonably capable of providing services to the public following strong ground motion.

The illustration below shows the SPC level a hospital can achieve to be 2030 compliant based on the year the hospital was constructed:



The chart below shows the status of SPC compliance of hospital buildings as of December 24, 2019. It is important to note that this chart shows the compliance level of individual buildings, not hospitals. For example, the chart shows 646 buildings, or 20.6% of all buildings, are still SPC 2 and therefore not yet 2030 compliant. However, these buildings are spread across 251 licensed facilities, which is well over half of the 418 licensed facilities in California:

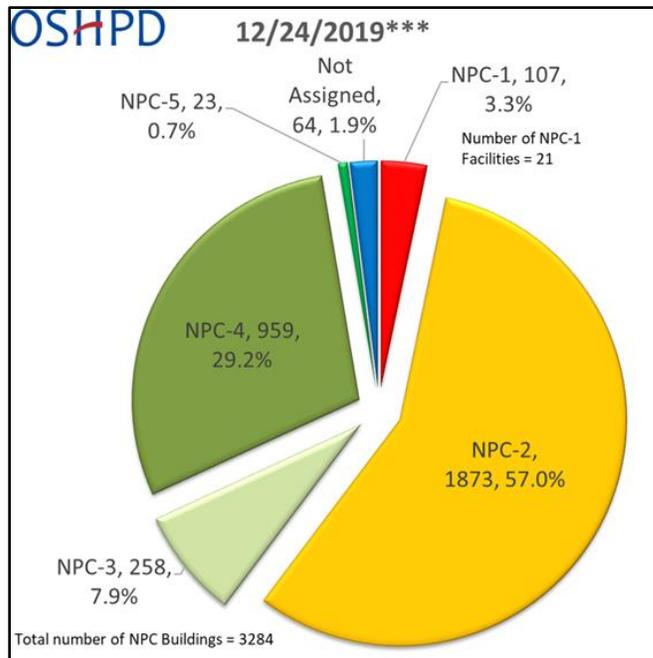


Explanation of NPC Ratings

The NPC requirements, unlike SPC requirements, are cumulative, and not different options. For example, a hospital is first required to achieve NPC 2, which ensures that the nonstructural components that are necessary for a safe evacuation are braced and anchored. Next, a hospital is required to achieve NPC 3 status, which ensures that at least the critical care areas are able to continue to function following an earthquake, and so on. The NPC standards are as follows:

- NPC 1 – The building does not meet any bracing and anchorage requirements.
- NPC 2 – The following systems in the building are braced or anchored according to the California Building Standards Code: communications systems, emergency power supply, bulk medical gas systems, fire alarm systems, and emergency lighting equipment and signs in the means of egress. *Hospitals had to meet at least the NPC 2 standard by January 1, 2002.*
- NPC 3 – This standard requires NPC 2 compliance, plus specified additional bracing and anchorage requirements in critical care areas, clinical laboratory services spaces, pharmaceutical service spaces, radiological service spaces, and central and sterile supply areas. *Hospitals had to meet this standard by January 1, 2008, unless an extension or exemption was approved. Extensions generally tracked the extensions given to SPC 1 buildings, so some buildings are not required to achieve NPC 3 until January 1, 2024.*
- NPC 4 – This standard requires NPC 3 compliance, plus all architectural, mechanical, electrical systems, components and equipment, and hospital equipment to meet bracing and anchorage requirements. *Hospitals are required to meet this standard by January 1, 2024 or 2030 depending on the building's seismic risk category and extension request requirements.*
- NPC 4D – This is a new category assigned to existing hospital buildings that are in compliance with NPC 3 requirements, and have additionally achieved one of three levels with regards to emergency preparedness. NPC 4D became effective on January 1, 2017. *Hospitals are required to meet this standard by January 1, 2030.*
- NPC 5 – This final standard requires the hospital building to meet NPC 4 or NPC 4D, plus have onsite supplies of water and holding tanks for sewage and liquid waste, sufficient to support 72 hours of emergency operations, which are required to be integrated into the plumbing systems. Additionally, an onsite emergency system, as defined in the California Electrical Code, must be incorporated in the building electrical system for critical care areas, and the system is required to provide for radiological service and onsite fuel supply for 72 hours of acute care operation. *Hospitals are required to meet this standard by January 1, 2030.*

The chart below shows the status of NPC compliance of hospital buildings as of December 24, 2019. Compared to the SPC compliance chart, the vast majority of buildings have not yet met 2030 standards. However, because NPC requirements generally do not involve decisions on whether to rebuild or replace, hospitals are more able to delay compliance with NPC requirements until closer to the deadline.



Conclusion

As the data from OSHPD reveal, there are very few remaining buildings that are at risk of collapse in an earthquake. With regard to the 2030 requirement to remain operational, 75% of hospital buildings are already 2030 compliant with regard to the more expensive SPC requirements. However, the remaining SPC 1 and 2 buildings, which must be taken out of service by 2030 or rebuilt to the SPC 4D standard, are spread across more than 250 hospital campuses. The California Hospital Association commissioned the RAND Corporation to update its prior estimates of the cost of future seismic safety compliance with a particular focus on the 2030 deadline. The RAND Corporation estimated that California hospitals still face a financial obligation potentially collectively totaling more than \$100 billion, depending in part on the extent to which hospitals replace buildings rather than retrofit. The California Hospital Association is sponsoring legislation this session that proposes to modify the seismic safety requirements by limiting the 2030 standard, among other changes, to only certain services provided by a hospital, including emergency services and surgical services, so that not all buildings on a hospital campus would be required to meet the 2030 standard. This hearing is an opportunity for the members of the Assembly and Senate Health Committees to hear an update from OSHPD on where hospitals are in terms of seismic safety compliance, to hear from hospitals about the challenges they face in meeting 2030 standards, and to hear from various stakeholders about the importance of hospital resilience in a seismically active state.